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CUL-DE-SAC PREGNANCY FOLLOWING *IN VITRO* FERTILIZATION AND EMBRYO TRANSFER

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SUMMARY

Objective: We report a case of cul-de-sac pregnancy following *in vitro* fertilization and embryo transfer (IVF-ET) in a patient with primary infertility.

Case Report: A 33-year-old primigravida woman underwent IVF-ET 4 weeks before her presentation. Serum β-human chorionic gonadotropin (β-hCG) on day 20 after embryo transfer was 901 mIU/mL. Ultrasound examination on day 30 after embryo transfer revealed an ectopic gestational sac with fetal heart beat in the left adnexa, without any evidence of intrauterine pregnancy. Laparoscopy was performed and revealed an ectopic mass in the congenital blind pouch that was connected to the posterior cul-de-sac. The gestational tissue was removed by forceps, and electrocauterization was used for hemostasis under laparotomy. Serum β-hCG fell to 7 mIU/mL after surgery.

Conclusion: Serum β-hCG combined with ultrasound scanning enables early diagnosis of ectopic pregnancy. [*Taiwan J Obstet Gynecol* 2007;46(2):171–173]

Key Word: cul-de-sac pregnancy, IVF-ET

Introduction

In 1976, Steptoe and Edwards described the first pregnancy from *in vitro* fertilization and embryo transfer (IVF-ET), but the pregnancy was ectopic [1]. The incidence of ectopic pregnancy following IVF-ET varies between 2% and 12% of clinical pregnancies, and the incidence of abdominal pregnancy is 2 in 7,500 IVF-EF pregnancies, which is about three to eight times the incidence in those of the general population [2,3]. With ultrasound scanning and serum β-human chorionic gonadotropin (hCG) measurement, it is possible for early diagnosis and management of ectopic pregnancy following IVF-ET. We report a case of cul-de-sac pregnancy following IVF-ET, with early diagnosis and successful management.

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Case Report

A 33-year-old woman, gravida 1, para 0, had primary infertility for 3 years. She had undergone a complete infertility investigation, and results from a hysterosalpingography performed in 2004 indicated a normal patent tube and uterine cavity. The sperm analysis of her husband revealed oligoasthenospermia.

The patient received, for pituitary downregulation, a long protocol of subcutaneous leuprolide acetate (Lupron; Takeda Pharma GmbH, Stolberg, Germany), 0.5 mg subcutaneously daily. Ovulation induction was achieved with human menopausal gonadotropin (Pergonal; Serono Laboratories, Geneva, Switzerland) and recombinant human follicle stimulating hormone (Gonal-F, Serono Laboratories, Geneva, Switzerland), 150 IU from day 3 to day 6, and 75 IU from day 7 to day 12. Human chorionic gonadotropin (Profasi®, Serono Laboratories, Geneva, Switzerland) 10,000 IU was given on day 13. On day 15 of the cycle, a transvaginal retrieval was performed, and four oocytes were collected. A transcervical transfer of two embryos was performed with the patient in the lithotomy position. Two embryos in 5 μL medium were loaded into a Cook

catheter (Cook, Australia) and injected into the uterus. The transfer proceeded smoothly without difficulty and bleeding. The catheter was introduced approximately 5.5 cm beyond the external cervical ostium, and the embryos were released. After the transfer, the patient was confined to bed rest for 2 hours before being discharged from the clinic. The luteal phase was supported with intramuscular administration of progesterone and hCG.

The patient presented with vaginal spotting without abdominal pain 15 days after embryo transfer. Quantitative β-hCG levels obtained on days 15 and 22 after the transfer were 23 and 901 mIU/mL, respectively. Vaginal ultrasound on day 21 did not reveal a gestational sac within the uterus. Although a gestational sac was not identified in the adnexa, the diagnosis of a possible ectopic pregnancy was made. On day 28 posttransfer, the ultrasound revealed an intense decidual reaction in the uterus and an ectopic gestational sac with a clear fetal heartbeat in the left adnexal area (Figure 1). Diagnostic laparoscopy revealed a right ovarian endometrioma (1 × 1 cm) adhering to the cul-de-sac, pelvic endometriosis in the cul-de-sac, and bilateral

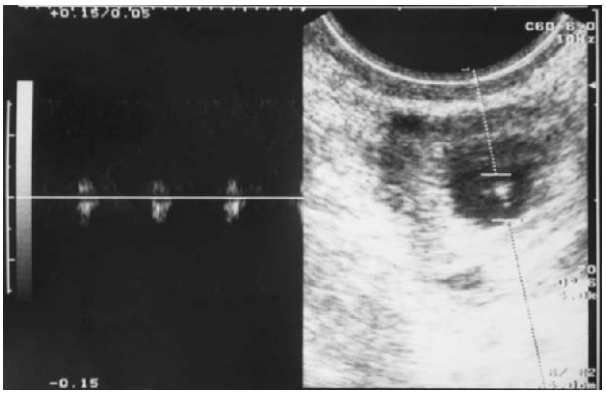

Figure 1. An ectopic gestational sac with a clear fetal heartbeat in the left adnexal area.

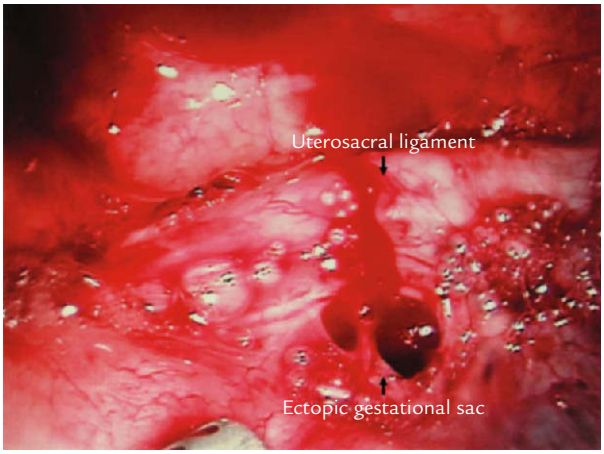

Figure 2. An ectopic gestational sac, approximately 2 cm in diameter, was implanted in the blind pouch of the cul-de-sac, close to the left uterosacral ligament.

normal tubes. An ectopic gestational sac of approximately 2 cm in diameter was identified in the congenital blind pouch that was connected to the posterior cul-de-sac by a fenestration close to the left uterosacral ligament (Figure 2). Secondary laparotomy was performed because of difficult hemostasis and to avoid vessel injury. The gestational tissue was removed by forceps, and electrocauterization was used for hemostasis. Enucleation of the right ovarian endometrioma, electrocauterization of the pelvic endometriosis, and lysis of the adhesion were also performed. The pelvis was irrigated profusely and blood aspirated. The patient tolerated the procedure well. Serum β-hCG fell to 7 mIU/mL 2 weeks after the surgery.

Discussion

The incidence of ectopic pregnancy following IVF-ET varies between 2% and 12% of clinical pregnancies. The incidence of abdominal pregnancy in pregnancies of IVF-ET patients is 2 in 7,500, which is about three to eight times the incidence in those of the general population. Known risk factors for ectopic pregnancy following IVF-ET include indication for *in vitro* fertilization and embryo transfer technique. Dubuisson et al reported that patients with tubal disease were more at risk of developing ectopic pregnancy than those with endometriosis or where male factor infertility (which was present in this case) was indicated [4]. The possible roles of embryo transfer technique in the etiology of ectopic pregnancy include ovulation induction protocol, volume of culture media used for embryo transfer, uteroperitoneal fistula, uterine perforation, distance below the fundus, and the patient's position at the time of embryo transfer. In this case, the abdominal implantation could have been because of transtubal migration, uterine perforation during transfer or (even less likely) through a fistulous tract. Embryo transfer under ultrasound is advised in order to avoid uterine perforation.

Early diagnosis can prevent rupture of ectopic pregnancy, which leads to hemoperitoneum and circulatory collapse. The combination of serum β-hCG measurement and transvaginal ultrasound scanning is an accepted method for the diagnosis of ectopic pregnancy. In our case, preoperative serum hCG concentration was not considered as a diagnostic aid; however, it was invaluable in the postoperative follow-up.

Laparoscopic surgery was not suitable for this case because of the site and the combination of pelvic endometriosis.

This case also highlights the importance of ultrasound scanning in all pregnancies during and after

IVF-ET. Clinicians must have a high index of suspicion and should counsel the patients regarding the rate of ectopic pregnancy after assisted conception.

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